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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/995,304

11/27/2001

Robert H. Kraus JR.

S-94,769

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10/06/2004

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EXAMINER

DO, PENSEE T

ART UNIT

PAPER NUMBER

1641

DATE MAILED: 10/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/995,304

Applicant(s)

KRAUS ET AL.

Examiner

Pensee T. Do

Art Unit

1641

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 September 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-63 is/are pending in the application.
- 4a) Of the above claim(s) 17-63 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-63 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

Applicant's election of group I, claims 1-16, filed on September 20, 2004 without traverse is acknowledged and entered.

Claims 17-63 are withdrawn from further consideration.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 is confusing for reciting "re-sorting". When was the first sorting of the distinct populations of magnetic particles occurred? What is there to sort on the distinct populations of magnetic particles? See also claim for "re-sort".

Claim is confusing for reciting "prior to an initial sorting stage". When did this initial sorting stage occur?

Claim 1 is unclear for reciting "sorting said distinct populations of magnetic microspheres by passage through a magnetic separator". How does the magnetic separator distinguish the different populations of microspheres one from the other because the magnetic particles regardless of the coating, would all be concentrated to an area by the magnetic field of the magnetic separator? What special characteristics of each of the distinct populations are being distinguished here?

Claim 14 is indefinite. The recitation of "adapted for" in the last two lines of the claim is unclear as to how the second reaction functionality has been modified to perform its recited function.

Claim 14 is indefinite of the role of the second reactive functionality bound to the non-magnetic particle. If the magnetic particle is bound to the non-magnetic particle, then where would the receptor or the target analyte bind on the magnetic particle? Through the non-magnetic particle? If so, then the non-magnetic particle must have some binder specific for the analyte.

Claims 11-14 recites "said forming magnetic microsphere..." which lacks antecedent support. Such phrase "forming magnetic microspheres" has not been defined or recited in claim 1.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 5, 6, 10, 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Wilson (US 5,932,097).

Wilson teaches magnetic particles and a process for using such magnetic particles to separate a sample. Such method comprises providing two magnetically distinct types of beads/particles, each bead conjugated to distinct biological recognition

molecules; combining those distinct types of beads/particles with a biological sample having different target molecules and allowing binding between the target molecules and the different types of magnetic particles conjugated with biological recognition molecules; and passing those distinct populations of magnetic particles containing the biological recognition molecules-target molecules complexes by passage through a magnetic separator/magnetic field generator. The particles comprise ferromagnetic materials or superparamagnetic materials. Regarding the limitation of claims 14-15, methods for the covalent attachment of biological recognition molecules to solid phase surfaces, including the magnetic particles can be chosen according to the functional groups available on the biological recognition molecule and the solid phase surface. Many reactive groups on both protein and non-protein compounds are available for conjugation. For example, organic moieties containing amines, carboxyl groups or that can be carboxylated can be conjugated to proteins via the mixed anhydride method. In this case, the second reactive functionality is a functional group such as carboxylate, amines, on the biological recognition molecule. The magnetic particles have large magnetic moments which can be made such that different strengths of magnetic moments and /or different magnetic field dependencies can be used to allow for separation of several affinity partners simultaneously. The method further analyzes for formation of one or more receptor agent-target species complexes within said microspheres containing the different attached receptor agents. It is inherent that the magnetic particle are of substantially the same dimensions since they have the same magnetic moments because if the size is substantially the same, then the ferromagnetic

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content is the same. The ferromagnetic content in the magnetic particle determines the strength of the magnetic moments. (see abstract; col. 4, lines 33-40; col. 5, lines 43-54; col. 6, lines 64-68; col. 9, lines 55-60; col. 15, lines 35-64; col. 18, lines 3-10).

Claims 1-6, 8-13, 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Miltenyi (US 5,543,289).

Miltenyi teaches a process for conducting of high gradient magnetic separation (HGMS). Superior superparamagnetic particles, coated with a polymer such as a polysaccharide or polystyrene, can be prepared in uniform compositions with homogeneous magnetizations. The coating can be conjugated to specific binding moiety complementary to a biological material whose purification or separation is desired. Then magnetization of the particles is measured. Magnetization means the magnetic moment per volume of the magnetic particles. Identical magnetic field for all the particles in the mixture is imposed. The superparamagnetic particles range from 0.04 μm to 0.1 μm in size. (see claim 1). Target biological materials are proteins, cells, viruses, bacteria, yeasts, glycoproteins, etc. (see col. 9, lines 6-21). Any number of components in a biological mixture can be labeled with particles of differing magnetizations by treating each homogeneous composition of particles with a different specific binding moiety complementary to a chosen component of the mixture. Each component will then uniquely react with one representative composition of a particular magnetization. The labeled mixture, when subjected to HGMS results in a chromatographic pattern of components separated according to the magnetization of the particles with which they are conjugated. (see col. 11, lines 54-65). Miltenyi also

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teaches that the superparamagnetic particles can be subjected to HGMS at any stage of its preparation process-before or after coating and before or after size preparation. The prepared particles are applied to HGMS apparatus and fractionated according to magnetic susceptibility). This teaching would apply to the limitation of claim 3- passing the magnetic microspheres through a magnetic field prior to the initial separation stage.(see col. 7, lines 55-62).

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1, 3, 4, 6, 10, 12, 13,16 are rejected under 35 U.S.C. 102(e) as being anticipated by Blankenstein (US 6,432,630).

Blankenstein teaches a micro flow system for separating particles. The system is used to separate a first group of particles of various types in a fluid into a plurality of set of particles; each set comprising a specific type of particles. A micro flow system with e.g. five separation outlets may be used to separate a fluid containing particles into five sets of particles, each set comprising particles that are influenced by the field with a force of a specific magnitude. The particles can be coupled to magnetic microbead.

The microbead may carry a monoclonal antibody or polyclonal antibody on its surface for coupling to an antigen of a cell to be separated by exposing the particles to a magnetic field generated with a permanent or an electromagnet. (see col. 6, lines 20-50). The magnetic particles have diameter of about 30 microns and a density of 1.2 times the density of water. (see col. 12, lines 50-60; col. 10, lines 20-22; col. 13, lines 26-27). The beads are superparamagnetic. The flow channel of the flow system is made up of glass, polymers, semiconductors, etc. (see col. 13, lines 33-38). Thus, when the magnetic beads are flow into the channel, it is equivalent to the magnetic beads are being embedded within a material that is made up of organic polymeric material or glass. (see col. 13, lines 43-48). When a magnetic field is turned on or applied to outside of the flow channels at a certain area, any magnetic beads along with the target species will be concentrated at that certain area and thus the magnetic beads are immobilized within the channel, which is made up of organic polymeric material or glass. The cells labeled with superparamagnetic beads are magnetized and attracted by the magnetic field whereby the flow of the magnetized particles is deflected into the sort outlet. This teaching means that the superparamagnetic particles must be have been passed through a magnetic field in order to be magnetized before going through the second sorting stage.(see col. 13, lines 24-29).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson (US 5,932,097).

Wilson has been discussed above.

However, Wilson fails to teach passing the magnetic microspheres through a magnetic field so as to magnetize the magnetic microspheres prior to an initial sorting stage.

Wilson teaches using paramagnetic particles.

It would have been obvious to one of ordinary skills in the art to magnetize the paramagnetic particles used in Wilson before performing any separation or sorting because it is well known in the art that paramagnetic particles need to be charged or magnetized before they can be used to perform any separation method such as one taught by Wilson because paramagnetic particles possess little, if any, magnetic susceptibility. Therefore, paramagnetic particles or superparamagnetic particles must first be passed through a magnetic field in order to be charged or filled with magnetic susceptibility at a certain point in the preparation process of the particles.

Allowable Subject Matter

Claims 7 and 14 and 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art fails to teach the magnetic particles are selected from iron-cobalt, iron-platinum, and samarium-cobalt and a non-magnetic particle bound to a second

reactive functionality. The non-magnetic particle is bound to the magnetic particle coated with a first reactive functionality such as amine or carboxylate groups through the interaction of the first and second reactive functionalities.

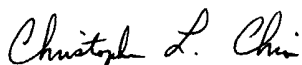
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pensee T. Do whose telephone number is 571-272-0819. The examiner can normally be reached on Monday-Friday, 7:00-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on 571-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Pensee T. Do
Patent Examiner
September 29, 2004


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10/1/04